

Application No. 10/736,625
Reply to the Office action of June 6, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application.

Listing of Claims:

1. (currently amended) A high pressure turbine vane assembly for a gas turbine engine, the vane assembly comprising a plurality of airfoils radially extending between inner and outer platforms defining an annular gas path therebetween, at least one of the inner and outer platforms being sealingly engaged to a downstream end of a combustion chamber wall enclosing a combustion chamber of the gas turbine engine in fluid flow communication with said annular gas path, wherein said at least one of said inner and outer platforms defines an inner surface facing said annular gas path and an outer surface which encloses at least part of a cooling air cavity defined between the combustion chamber wall and said at least one of said inner and outer platforms, said outer surface being directly exposed to cooling airflow within said cooling air cavity upstream heat transfer interface of said vane assembly which directly receives cooling airflow directed to said vane assembly from a cooling air source of the gas turbine engine, wherein a plurality of holes extend between said outer surface and said inner surface are defined in said upstream heat transfer interface within a region thereof of said at least one of the inner and outer platforms substantially intermediate adjacent airfoils, the holes providing fluid flow communication between the cooling air source cavity and the annular gas path and directing cooling airflow therethrough such that effusion cooling of the vane assembly is provided.
2. (currently amended) The vane assembly as defined in claim 1, wherein the holes are substantially evenly distributed adjacent either side of the airfoils.

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3. (original) The vane assembly as defined in claim 1, wherein the holes are disposed in a longitudinal fluid flow direction between leading edges and trailing edges of the airfoils.
4. (original) The vane assembly as defined in claim 1, wherein the holes are asymmetrically distributed in the platform relative to the airfoils.
5. (original) The vane assembly as defined in claim 4, wherein the holes are concentrated in a manner corresponding to regions of the platform experiencing at least one of highest gas flow temperatures and highest heat transfer coefficients.
6. (original) The vane assembly as defined in claim 1, wherein the holes are inclined downstream, such that the cooling airflow exits the holes defines an acute angle relative to the at least one of the inner and outer platforms.
7. (currently amended) A vane assembly for a gas turbine engine, the vane assembly comprising: a first and a second platform and a plurality of airfoils extending radially therebetween, the airfoils having leading and trailing edges, at least the first platform is sealingly engaged to a wall portion of a gas conveying means disposed immediately upstream from said first platform, said gas conveying means being for directing a gas flow of said gas turbine engine to said airfoils, said first platform having an inner surface exposed to said gas flow between said first and second platforms and an outer surface which encloses at least part of a cooling air cavity defined between said wall portion and said first platform and which receives cooling airflow from a cooling air source of the gas turbine engine, said outer surface being directly exposed to said cooling airflow within said cooling air cavity defines an upstream heat transfer interface of said vane assembly which directly receives cooling airflow directed to said vane assembly from a cooling air source of the gas turbine engine, said first platform having a plurality of

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effusion cooling holes defined therein through and extending between said outer and inner surfaces within at least one region of the first platform upstream heat transfer interface, the region disposed between the airfoil leading and trailing edges, the holes permitting air flow communication through the first platform from said cooling air cavity to said gas flow between said first and second platforms.

8. (original) The vane assembly of claim 7, wherein the region, in use, corresponds to at least one of highest gas flow temperatures and highest heat transfer coefficients experienced by the vane assembly.
9. (original) The vane assembly of claim 7, wherein the at least one region comprises at least one region between each of adjacent pairs of said airfoils.
10. (original) The vane assembly of claim 7, wherein the region is asymmetrically disposed relative to a pair of said airfoils immediately adjacent the region.
11. (currently amended) A method of cooling a vane assembly disposed in a gas path of a gas turbine engine, the vane assembly having a plurality of airfoils radially extending between inner and outer platforms each having a first surface enclosing said gas path and an opposed second surface, the method comprising:
determining regions on the inner and outer platforms which experience highest gas flow temperatures;
providing a plurality of holes extending between said first and second surfaces in or at least one of the inner and outer platforms and in at least the regions thereof substantially intermediate adjacent airfoils, said at least one of the inner and outer platforms defining an upstream heat transfer interface of said vane assembly;

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directing compressed cooling air from a cooling source to a cavity defined at least partially between said second surface of said at least one of the inner and outer platforms and a means for conveying the gas path disposed immediately upstream of said at least one of the inner and outer platforms, said cooling air within said cavity being in direct fluid flow communication with said gas path via said holes directly to the holes within said upstream heat transfer interface; and
effusing the cooling air through the holes out into the gas path intermediate adjacent airfoils to cool the vane assembly.

12. (previously presented) The vane assembly of claim 7, wherein the holes are substantially evenly distributed adjacent either side of the airfoils.